Kick-Off Meeting Minutes

Field Investigation of Geosynthetics Used for Subgrade Stabilization

Montana Department of Transportation

8:00 to 10:00AM, Monday – March 31, 2008

Attendees

- Montana Department of Transportation: Sue Sillick, Brian Collins, Jeff Jackson, Bret Boundy, Rich Jackson, Terry Wickman (Great Falls)
- Western Transportation Institute (WTI), Montana State University: Eli Cuelho, Steve Perkins, Michelle Akin
- NAUE GmbH & Co. KG: Kent von Maubeuge
- Idaho Transportation Department: Tri Buu
- South Dakota Department of Transportation: Bob Longbons
- Wyoming Department of Transportation: Jim Coffin
- Christopher Consultants: Barry Christopher
- Tensar International Corporation: Julie Christensen

Project Administration

The technical panel oversees the project from beginning to end; they have reviewed the proposal, will receive progress reports, and will review the final report. Sue is the liaison between the technical panel through MDT and research team at WTI for any items concerning the scope, budget, or timeline. Technical details can be addressed to individual panel members. The technical panel makes implementation recommendations at the end of the project. Participation by the technical panel is encouraged.

Progress reports will be sent to the technical panel on a quarterly basis. The first progress report will cover the period of March – June. The final report will also be accompanied by a four-page project summary. A meeting will be held at the end of the project to present the final report/findings.

Kent von Maubeuge will communicate directly with Eli, but emails can be copied to Sue (and vice versa).

- ***Action Item***: Eli will send Kent's email address to Sue

The Project

- States' Perspectives
  - **South Dakota (Bob Longbons)**: South Dakota recognizes the need to save resources. It is becoming more unrealistic to be able to rework the top two to three feet of subgrade - so they are interested in other tools to help in this regard. In addition, they have found side-by-side comparisons of geogrids and geotextiles perplexing, especially whether good separation is achieved with a geogrid (the manufacturers say there is), or if there is too much particle intrusion.

- **Wyoming (Jim Coffin)**: Like South Dakota, as well as many other states, they are also under budget constraints. They want to fine-tune methods, materials and procedures related to subgrade stabilization. They also want to minimize granular backfill because the cost has sky-rocketed in recent years. For subgrade stabilization, they currently use a proprietary design, but are eager to learn how geotextiles and other geogrids will perform under similar circumstances. Lastly, they would like to quantify how junction strength is related to survivability and long-term performance.
- **Idaho (Tri Buu)**: Idaho also sees the need for a more generic specification for subgrade stabilization. Currently, they use a manufacturer recommended junction strength specification, but would eventually like to determine the amount of junction strength needed for specific projects.
- **Montana (Brian Collins)**: Montana was initially interested in the project because of uncertainty about geogrid performance when used as subgrade stabilization. Montana would eventually like to begin developing a specification for geosynthetics used for this function, and see this as a first step in that direction. They also want to know when it is most appropriate to use geotextiles versus geogrids.
- **NAUE (Kent von Maubeuge)**: NAUE has heard from several states that there is conflicting information from different manufacturers in terms of geosynthetics used for subgrade stabilization. NAUE also sees this as a first step to understanding how specific material properties relate to the stabilization function. They are excited to have several states participate because having a larger group adds technical merit to the project.
- **WTI (Eli Cuelho)**: This project is generally geared toward evaluating the relative performance of several geosynthetics used as subgrade stabilization. Information from this project can be used to help clarify how and why certain products perform, however, the aim of this project is not specifically to develop a new specification tool for geosynthetics used in this way.

- Subgrade Material
  - This is probably the most important part of this project, and construction will not just be business as usual with the contractor. Good communication with QC/QA during construction will be critical. A uniform California Bearing Ratio (CBR) of approximately 2 is desired – which contradicts typical highway construction practices. This was one of the primary motivations for locating the project away from an actual road. It was also thought a smaller contractor may be beneficial in this case since they may be easier to work with and less concerned about getting the job done as quickly as possible. There is a requirement to contract with the lowest bidder, but careful preparation of the Request for Bids (RFB) should ensure that even the winning bidder will provide good work. The RFB will be sent to the technical panel for their review before distribution.
  - Two potential sources for the subgrade material were recently located. The most promising of the two consists of materials that were dredged from a settling pond associated with a wash operation at a gravel pit in Lewistown, Montana.
  - CBR is being currently being evaluated in the laboratory to help potentially determine a preferred construction method for the field test sections. For instance, it may be possible to use standard compaction techniques and then soak/flood the area to reduce the CBR to the desired value. This technique would at least reduce any surprises during compaction and will probably yield a more uniform subgrade.

- The vane shear device will be the primary tool used to monitor subgrade strength. The dynamic cone penetrometer may also be used if the vane shear is unable to accurately characterize subgrade soil strength. Both devices will be calibrated in the laboratory with the actual subgrade material to correlate strength values to CBR.
    - ***Action Item***: Jeff will look into the possibility of WTI using MDT's DCP and/or vane shear
- Multiple soil samples will be collected from the subgrade to fully characterize its material properties (e.g., Atterberg limits, gradation, and moisture content).
- Construction of the prepared subgrade will probably occur between the end of June and the end of July.

- Geosynthetic Materials
    - The geosynthetic materials will either be donated or purchased. NAUE will donate (and ship) their materials. Manufacturers who donate materials will not automatically be members of the technical panel.

- Instrumentation and Measurements
    - Pore pressure will be measured at one location in each section because increased pore pressures have been shown to significantly affect performance.
    - Displacement of the geosynthetic will be measured to estimate strain in the rut bowl. This information will be verified using measurements of the rut profile during post-traffic exhumation.
    - Geosynthetic damage will be assessed according to current ASTM standard procedures. The tensile strength before construction and after loading will also be measured.
    - Rut profile measurements will be periodically measured during loading. Although not directly part of this project, Kent will contact the researcher in Kingston, Ontario about using a blimp and photogrammetry to measure rutting.
    - Weather data will be available during the experiment from a weather station located at the Transcend test facility.

- Miscellaneous
    - The test vehicle will have 18 kip (80 kN) axle loads (for tandem rear axles).
    - NAUE asked about having a webcam for viewing the construction – this would help all who can't travel to the site during construction.
        - ***Action Item***: Eli will look into this possibility – at least still digital pictures will be taken.
        - ***Action Item***: Sue will add Barry Christopher and Kent von Maubeuge to the email distribution for the project.